DOCUMENT RESUME

ED 104 677 SE 018 848

AUTHOR Stronck, David R.
TITLE Lessons Taught by Students in Training to Become Biology Teachers Simultaneously Evaluated by Their Peers and by Their Students.
PUB DATE Mar 75
NOTE 12p.; Paper presented at the annual meeting of the National Association for Research in Science Teaching (48th, Los Angeles, California, March 1975)

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE
DESCRIPTORS *Evaluation; Higher Education; *Microteaching; Peer Groups; *Preservice Education; Science Education; *Student Evaluation; Teacher Education
IDENTIFIERS Research Reports

ABSTRACT

The prime objective of this study was to collect evaluations on instruction performed by student teachers and to compare the evaluations done by their peers with those done by their students. Another objective of this study was to consider changes in the evaluations when the first performance of student teachers was compared with their second performance. The study considered lessons taught by 58 student teachers in 4 different semesters. A nine-item questionnaire was specially prepared for this study. A total of 2,399 questionnaires was completed by students receiving instruction, while the total number of questionnaires completed by the peers was 314. A sample of thirteen student teachers did two lessons, both of which were evaluated. The time between performances was four to six weeks. The *t*-tests indicated highly significant differences between the evaluations done by the peers and those by the students, in the totals and in seven of the nine categories at the 0.001 level. In all categories, the students rated the performances of the student teachers as poorer than did peers. There were no significant differences between the ratings given by the students for the first performance compared with the second performance. Student teachers should recognize these significant differences between student and peer evaluations when they attempt to interpret evaluations from microteaching. (Author/BR)

ED104677

# LESSONS TAUGHT BY STUDENTS IN TRAINING TO BECOME BIOLOGY TEACHERS SIMULTANEOUSLY EVALUATED BY THEIR PEERS AND BY THEIR STUDENTS

David R. Stronck
Washington State University
Pullman, Washington

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

## INTRODUCTION

Microteaching has been defined as a scaled-down sample of actual teaching which generally lasts ten to thirty minutes and involves four to ten students. [1] This technique for preparing future teachers has become extremely popular in the United States. In a recent survey of institutions, 84% indicated that microteaching was used a great deal or at least moderately. [2]

J. J. Koran, Jr. [3] observed that although many criticized the microteaching context as being an artificial one in comparison with the school situation, it did permit achievement of the objectives desired. Nevertheless, the evaluations of performances within microteaching should be translated from this artificial context into the typical classroom situations. In other words, student teachers should not anticipate that evaluations done by peers will be the same as those which would be done by secondary school students.

## OBJECTIVES

In this study "student teachers" are students in training to become secondary school teachers of biology and doing some instruction in a classroom. All of the student teachers in this study are enrolled at Washington State University in Pullman, Washington. "Peers" are other students teachers whose activity is completing questionnaires, not in doing instruction. "Students" are those enrolled in the biology course and receiving instruction from the student teachers.

A paper presented at the Annual Meeting of the National Association for Research in Science Teaching, March 1975



SE 018 848

The major objective of this study is to collect evaluations on the instructions performed by student teachers and to compare the evaluations done by their peers with those done by their students. Significant differences between these evaluations would suggest insights into the interpretation of microteaching. Another objective of this study is to consider changes in the evaluations when the first performance of student teachers is compared with their second performance.

METHODS

A nine-item questionnaire was specially prepared for this study. This instrument was an adaptation of one by Sussman and Voss. [4] The original instrument was twice modified during the three semesters of trial use before the study began. The final questionnaire asks the respondent to describe the student teacher's performance in nine categories. These nine categories were selected because they tended to collect a variety of responses and because they seemed to cover the open statements invited at the end of the questionnaire. Each category has its own five point scale with three words explaining the extremes and the middle position of the scale.

The questionnaire begins with the statement "Place an 'X' on the scale to describe your opinion of the teacher. There are five blanks on each of the ten scales." The first category is (1) knowledge of subject matter. The scale is indicated by the three words: excellent - adequate - poor. The other categories and scales are the following.

(2) attitude toward subject: enthusiastic - interested - apathetic,

(3) explanations given: clear - adequate - confusing,

(4) speaking ability: interesting - average - boring,

(5) attitude toward students: helpful - responsible - aloof,

(6) personality: mature - satisfactory - very nervous,

(7) evidence of planning in procedures and materials: great - adequate - none,

(8) students' attention: active - adequate - distracted,

(9) objectives: clear - confusing - unknown

This study also reports a tenth category which is the averaging of the other nine.

The questionnaire ends with two open-ended questions: (1) What were the teacher's strongest points? (2) What were the teacher's weakest points? In general, the students neglected to respond to these questions although the peers made very helpful statements.

The design of the study is to test the major null hypothesis: "There is no statistically significant difference between the evaluations of student teachers done by their peers and the evaluations done by their students." The evaluations were done simultaneously by the peers and the students considering the same performances in the same room. The analysis of the data considers each category of the questionnaire as well as the total performance described by the questionnaire. Each category then provides a subhypothesis. For example, the subhypothesis for the first category is the following: "There is no statistically significant difference between the evaluation of the student teacher's knowledge of subject matter done by their peers and the evaluations of the student teacher's knowledge of subject matter done by their students."

A second major hypothesis is the following: "There is no statistically significant difference between the evaluations of student teachers in their

first performance and the evaluations of their second performance." This major hypothesis also has nine subhypotheses to consider each of the categories on the questionnaire.

## DATA SOURCES

The study considered lessons taught by 58 student teachers in four different semesters. Each lesson was approximately one-half hour in length and was closely related to performing a laboratory experiment in biology. These experiments were typical of those performed by tenth-grade biology students throughout the United States.

The total number of questionnaires completed by students receiving instruction was 2,399 or an average of more than 41 students per lesson. The total number of questionnaires completed by the peers was 314 or an average of greater than 5 peers per lesson. A sampling of 13 student teachers did two lessons which were both evaluated. The time between performances was four to six weeks.

The author of this study was present at all of these lessons. He observed uniform conditions for the presentations and completed the questionnaire for each lesson. In general, his responses were extremely similar to those provided by the peer group.

## RESULTS

The t tests indicated highly significant differences between the evaluations done by the peers and those by the students in the totals and in seven of the nine categories at the 0.001 level. In all categories the students rated the performances of the student teachers as poorer than the ratings given the peers. The one category which did not produce a significant

difference was (2) attitude toward subject. Category (9), objectives, provided a significant difference at the 0.05 level.

In responding to the questionnaire the peers and students merely placed an "x" at one of the five spaces on the scale. The best possible performance was interpreted as a score of 1; the lowest possible score was interpreted as a score of five. The mean averages demonstrate that both peers and students generally considered the performances in all categories to be between excellent and good, that is between the scores of 1 and 2. Table 1 describes these results.

INSERT TABLE 1 HERE

Some students were evaluated on two performances during the semester. Although each performance involved a different lesson, these lessons were on similar topics and were done with the same format under nearly identical circumstances.

There were no significant differences between the ratings given by the students for the first performance compared with the second performance. On four categories, especially (4) speaking ability, scores improved. In the other five categories the scores were slightly lower. Table 2 provides the results.

INSERT TABLE 2 HERE

In most categories the peers also did not observe any significant differences between the performances. Nevertheless, at the 0.001 level, the peers recorded significant differences between the two performances in category (1) knowledge of suject matter. At only the 0.05 level, they saw

significant differences in category (6) personality, especially this last category describes an improvement in the poise and manner of the student teachers who were overcoming nervousness. At the 0.01 level, the peers recognized improvements in the total scores. Only in category (9), objectives, was the mean lower for the second performance. Table 3 gives these results for the comparisons.

INSERT TABLE 3 HERE

SIGNIFICANCE

The evaluations of teaching abilities given to student teachers by their peers tend to be more complimentary than those which can be anticipated from their students. Although students may fail to recognize improvement in later teaching performances, peers tend to find improvement especially in the area of nervousness and poise. Probably the judgment of the peers is a more correct analysis. But perhaps of more importance is to recognize the characteristics of judgments made by the students. High school students demonstrate a trend toward no change in judgment or even toward less favorable judgments of later performances. The novelty of a new student teacher in his first performance may have balanced against this trend toward more rigorous evaluation to produce no significant changes in the students' evaluations of the two performances. Student teachers should anticipate that full-time teachers should perform well with their students at the beginning of each school year. The students may be making relatively stable evaluations early in each year.

Moreover, student teachers should not become overconfident in studying the evaluations of their performances in microteaching. They should anticipate

that students will be significantly more critical in their evaluations. As new teachers enter the profession, they should recognize the need for continual growth in their performances. This growth can be aided by seeking evaluations from their students.

## REFERENCES

1. Olivero, James L., "Micro-Teaching: Medium for Improving Instruction," Charles E. Merrill, Columbus, Ohio, 1970.

2. Sherwin, Susan S., "Performance-Based Teacher Education: Results of a Recent Survey," Teacher Programs and Services Educational Testing Service, Princeton, New Jersey, 1973.

3. Koran, John J., Jr., "Training Science Teachers: Methodological Problems and Issues in Changing Behavior," Journal of Research in Science Teaching, 11, 203-218, 1974.

4. Sussman, Alfred and Burton Voss, "Instrument for Student Evaluation of Teaching," in Addison E. Lee, Ed., "The Pre-Service Preparation of Secondary School Biology Teachers," The Commission on Undergraduate Education in the Biological Sciences, Washington, D. C., 1969.

TABLE 1

Results of tests for the significance of the mean differences between evaluations done by the peers and those done by the students.

| | Category | Student Mean | Peer Mean | t Statistic |
|---|---|---|---|---|
| 1. | Knowledge of Subject Matter | 1.6721 | 1.4842 | 3.6447 ** |
| 2. | Attitude Toward Subject | 1.8100 | 1.6719 | 2.4385 * |
| 3. | Explanations Given | 2.0139 | 1.7516 | 4.1296 ** |
| 4. | Speaking Ability | 1.9418 | 1.7411 | 4.5116 ** |
| 5. | Attitude Toward Students | 1.8113 | 1.3740 | 6.9816 ** |
| 6. | Personality | 1.7001 | 1.3622 | 7.0592 ** |
| 7. | Evidence of Planning in Procedures and Materials | 1.7683 | 1.5174 | 4.1052 ** |
| 8. | Students' Attention | 2.0124 | 1.7784 | 4.2321 ** |
| 9. | Objectives | 1.7167 | 1.6221 | 1.3045 |
| 10. | Totals | 16.4465 | 14.3029 | 5.9228 ** |

*Significant at the 0.05 level.
**Significant at the 0.001 level.

TABLE 2

Results of tests for the significance of the mean differences between evaluations of the first performance and those of the second performance; these evaluations were done by the students.

| | Category | First Performance | Second Performance | t Statistic |
|---|---|---|---|---|
| 1. | Knowledge of Subject Matter | 1.5157 | 1.5231 | -0.1179 |
| 2. | Attitude Toward Subject | 1.6940 | 1.6061 | 0.9104 |
| 3. | Explanations Given | 1.7865 | 1.7844 | 0.0203 |
| 4. | Speaking Ability | 1.7554 | 1.6409 | 1.3758 |
| 5. | Attitude Toward Students | 1.3909 | 1.4623 | -0.9044 |
| 6. | Personality | 1.5126 | 1.4623 | 0.7849 |
| 7. | Evidence of Planning in Procedures and Materials | 1.6448 | 1.6705 | -0.5016 |
| 8. | Students' Attention | 1.7734 | 1.8367 | -0.6951 |
| 9. | Objectives | 1.5657 | 1.5829 | -0.1772 |
| 10. | Totals | 14.6389 | 14.5694 | 0.1280 |

TABLE 3

Results of tests for the significance of the mean differences between evaluations of the first performance and those of the second performance; these evaluations were done by the peers.

| | Category | First Performance | Second Performance | t Statistic |
|---|---|---|---|---|
| 1. | Knowledge of Subject Matter | 1.5679 | 1.3000 | 4.2155 *** |
| 2. | Attitude Toward Subject | 1.4744 | 1.3962 | 0.5709 |
| 3. | Explanations Given | 1.5744 | 1.5141 | 0.3769 |
| 4. | Speaking Ability | 1.7500 | 1.3462 | 0.2666 |
| 5. | Attitude Toward Students | 1.2461 | 1.1038 | 1.5804 |
| 6. | Personality | 1.3782 | 1.1038 | 2.4706 * |
| 7. | Evidence of Planning in Procedures and Materials | 1.6051 | 1.3962 | 1.3673 |
| 8. | Students' Attention | 1.6577 | 1.5487 | 0.9115 |
| 9. | Objectives | 1.3474 | 1.3756 | -0.2223 |
| 10. | Totals | 13.6012 | 12.0846 | 3.0459 ** |

*Significant at the 0.05 level.
**Significant at the 0.01 level.
***Significant at the 0.001 level.